

# **Introduction of Integrated Management of Satellite Imagery Information**

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## **ABSTRACT**

The high prices of satellite images prevent researchers from studying remote sensing and most non-professional people doesn't have the simple and easy solutions for the manipulation of satellite images.

"Integrated Management of Satellite Imagery Information" project which will be promoted by ETRI (Electronics and Telecommunications Research Institute) will provide the solutions for the above mentioned problems. We will introduce the archiving center in this study. This includes the data construction, storage, management and distribution. We first review the background for this archiving center and introduce the interior and foreign institutes which archive and distribute satellite images. We review our H/W system and S/W system briefly. Finally, the further service of our project will be suggested.

Since we will distribute the satellite images (Landsat, SPOT, JERS, Corona, Kompass-1) and will receive Landsat7 ETM+ in 2003 year, this will help the professional work dealing with the satellite image and attract the non-professional people for simple and easy manipulation solutions of satellite image.

**Keywords: Remote Sensing, Satellite Image, Archiving**

## **1. INTRODUCTION**

Since satellite image has properties of high resolution, multispectral and wide photographing, it is originally used in the military and environmental field. But it is used more and more in the field of map production, agriculture, forestry, planning of national

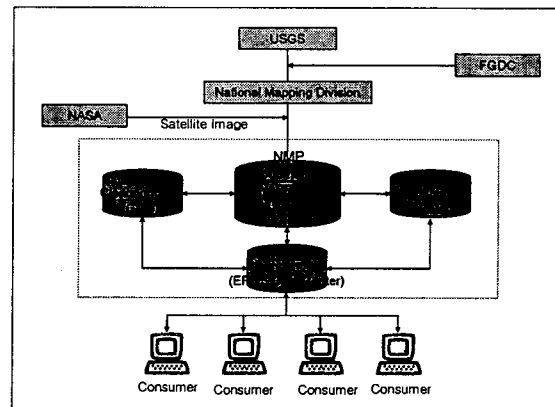
land, establishment of city plan, etc lately. Possibility of periodic data acquisition of satellite image and diverse satellite images between hyperspectral and high resolution satellite image makes the satellite images the important resource for the record of national land. So, it is necessary to preserve the satellite images which contain the change of geographic information, national

land, and environment for the form of digital library or museum.

Though many government organizations, self-governing body and public research institution make use of satellite image and do its own project under the base of satellite image now, insufficient cooperation and co-work result in the overlapping purchases of satellite image widely. In addition, processing of satellite image is done using foreign software because of nonsystematic management of the developed technology and these facts result in the mass budget waste for each year. For the solution of this problem, it is necessary to establish the service which gives and manages the information of satellite image systematically and distribute these information to the institute which need freely.

In this study, we introduce the "Integrated Management of Satellite Imagery Information" project. This project which will be promoted by ETRI (Electronics and Telecommunications Research Institute) will provide the solutions for the above mentioned problems. This introduction of project includes the data construction, storage, management and distribution. We first review the background for this project and introduce foreign and interior institutes which archive and distribute satellite images. We introduce our H/W system and S/W briefly. Finally, the further service of our project will be suggested.

## 2. Foreign and interior trends of Integrated Management of Satellite Imagery Information



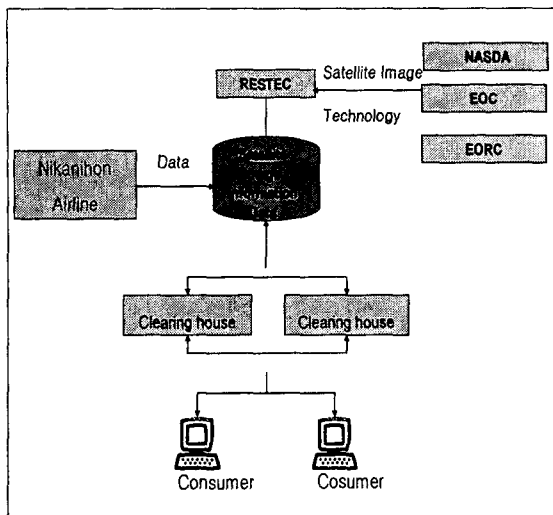
**Figure 1 USA satellite Imagery Information Service organization**

USGS (U.S. Geological Survey) has three Clearing houses for the distribution of data : EROS(Earth Resources Observation Systems) Data Center Clearinghouse Gateway, Alaska Geospatial Data Clearinghouse Gateway, GLIS(Global Land Information System) Clearing Gateway.

FGDS (Federal Geographic Data Committee) provides the metadata and distribution standard for the USGS.

The RESTEC (Remote Sensing Technology Center) in Japan has the role to perform data collection using ground station reception and processing and to perform analysis and research using the observed data. NASDA (National Space Development Agency of Japan) provides the satellite image data and EORC (Earth Observation Research Center) provides the

application software for the satellite image.



**Figure 2 Japan Satellite Imagery Information Service Organization**

For the foreign cases, we can note that the information of satellite image is systematically managed by the government.

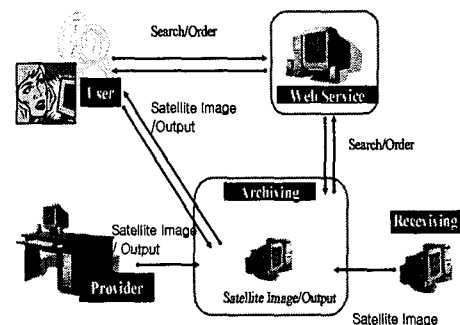
For the domestic case, integrated management of satellite image information service is not constructed, but some institutes have their own search and distribution service and another institute distributes their own data for the institutes which needs them.

From these facts, the overall information of satellite image should be constructed for the efficient use of information of satellite image. Though we cannot manage overall satellite images in Korea, this project will be the basis of the upcoming integrated management of satellite image information of Korea.

### 3. "Integrated Management of Satellite Imagery Information" project

The goal of this study is the introduction of "Integrated Management of Satellite Imagery Information" project which will be constructed by ETRI. This project aims at the efficient management of satellite image information. The final aim of this project is that users can find the information and tools that they need for satellite image in this project and can purchase satellite image freely or inexpensively using the method of search and distribution which is offered by this project. If he can find the satellite image in this project, he can purchase directly. If he can find the satellite image in another site, he can obtain the purchase information.

The brief system of this project is in Figure 3.

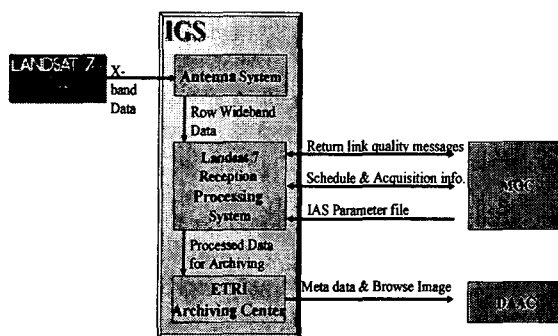


**Figure 3 System Architecture**

This project consists of three parts: reception of Landsat7 satellite image, data archiving and web service.

For the reception Landsat7 satellite image, we are

developing the H/W and S/W for the receiving Landsat7 satellite. For this, we will make the DRC(Data Receiving Card) card, receiving and storage S/W, image signal format transformation and pre-process S/W. We will receive the Landsat 7 in 2003. Also, we develop the technology about the automatic GCP chip construction and geometric correction of Landsat7 satellite image.

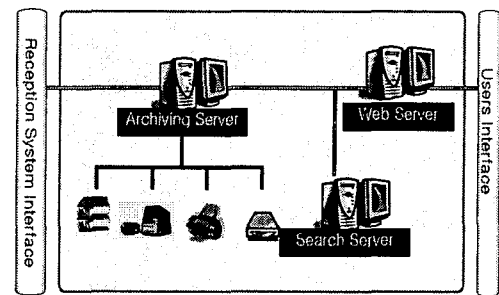


**Figure 4 Reception**

For the data archiving, we develop the technology about registration, management and distribution of data. We will archive Landsat MSS, TM, ETM+, SPOT, JERS, Corona and Kompsat-1 satellite images data. We also will archive the output material using the satellite images. For these purposes, we design the metadata for the satellite image which we will archive. This metadata is consistent with the NGIS standard.

For the web service, we will construct the system based on the Windows 2000 or XP using the C++, Java, CGI, ASP, JSP, ODBC and JDBC, etc. In 2002, we will

service the following contents: search and order for the satellite image, education materials for the professionals, information about the satellite image and remote sensing. Later, we will increase the contents which contain the user customized service and education materials for the non-professionals.



**Figure 5 Archiving and Web Service**

The following table 1 summarizes the system configuration.

**Table 1 System Configuration**

|           | Work   |
|-----------|--|
| Receiving | <ul style="list-style-type: none"> <li>- DRC card, receiving and storage S/W</li> <li>- Image signal format transformation S/W</li> <li>- automatic GCP chip construction</li> <li>- geometric correction of Landsat 7 image</li> <li>- Landsat 7 satellite image reception(2003)</li> </ul> |
| Archiving | <ul style="list-style-type: none"> <li>- Registration, Management, Distribution S/W</li> <li>- Metadata for satellite image</li> <li>- Compression technology using wavelet</li> <li>- Best Quality Image Archiving</li> </ul>   |

|             |  |
|-------------|--|
|             | (Landsat (MSS, TM, ETM+), SPOT, JERS, Corona ,Kompsat-1)   |
| Web Service | <ul style="list-style-type: none"> <li>- Search and Order</li> <li>- Education Materials</li> <li>- User customized S/W</li> <li>- Contents about satellite image</li> </ul> |

#### 4. Conclusions

In this study, we introduce the “Integrated Management of Satellite Imagery Information” project briefly. Through this project, people will obtain the satellite image information easily. From this project, we hope that people don’t spend much time to purchase satellite image and develop same technology about satellite image which is previously made by another persons.

Since this project is related with many institutes which deal with the satellite images, we will discuss many problems about this project with concerned institutes and induce good model for the integrated management of satellite image.

The Landsat 7 image which will be received by ETRI will be distributed freely to the public domain in 2003.

#### References

- [1] USGS Homepage : <http://www.usgs.gov>  
Eros Data Center: <http://edcwww.cr.usgs.gov/>
- [2] RESTEC Homepage :  
[http://www.restec.or.jp/restec\\_e.html](http://www.restec.or.jp/restec_e.html)